WHAT IS CLAIMED IS:

1. A method for sensing an image comprising:

integrating charge in an image sensor array;

transferring the charge out of the image sensor array;

converting the charge to a digital signal;

combining the digital signal with digital data stored in a memory device to form an integrated signal;

storing the integrated signal in the memory device such that the integrated signal becomes the digital data; and

repeating the above steps N times during a frame time cycle, where N is an integer greater than one.

2. The method of claim 1 wherein the step of the combining the digital signal with the digital data comprises summing the digital signal and the digital data to form the integrated signal.

3. The method of claim 1 wherein the step of storing the integrated signal comprises storing the integrated signal in addresses corresponding to pixels in the image sensor array.

4. The method of claim 1 wherein the step of combining the digital signal with the digital data comprises:

loading a line of data from the digital signal into a digital shift register;

retrieving a data line of the digital data from a corresponding location in the memory device;

summing the line of data with the data line from the memory device; and

storing the integrated signal back into the corresponding location in the memory device.

5. A method for sensing an image comprising:

integrating charge in pixels of an image sensor array in response to incident light;

providing an analog output signal from the image sensor array that indicates charge levels for each pixel in the array;

converting the analog output signal to a digital signal;

transferring the digital signal to a digital memory device;

repeating the above steps N times during a frame time cycle, where N is an integer greater than one; and

performing digital integration in the digital memory device by cumulatively combining the digital signal of a present step with the digital signal of previous steps.

6. The method of claim 5 further comprising reading a digital image signal from the memory device.

7. The method of claim 6 further comprising converting the digital image signal to an analog signal.

8. The method of claim 5 further comprising storing the digital signal in addresses corresponding to each pixel in the image sensor array.

9. The method of claim 5 wherein the step of performing digital integration comprises:

loading a line of data from the digital signal into a digital shift register;

retrieving a data line from a corresponding location in the memory device;

summing the line of data with the data line from the memory device to form an integrated signal; and

storing the integrated signal back into the corresponding location in the memory device.

10. An image sensing device comprising:

an array of image sensing pixels;

an analog-to-digital converter coupled to an output of the array;

a digital memory device coupled to an output of the converter, wherein the digital memory device cumulatively combines an output from each pixel with an output from a previous readout of each pixel each time the array of image sensing pixels is readout during a frame time cycle.

11. The device of claim 10 wherein the digital memory device comprises:

a digital shift register coupled to the output of the analog-to-digital converter;

an adder coupled to the digital shift register; and

a digital memory array coupled to the adder.

12. The device of claim 10 further comprising a shift register coupled to the array of image sensing pixels.

13. The device of claim 12 further comprising a buffer amplifier coupled between the shift register and the analog-to-digital converter.